

This listing of claims will replace all prior versions, listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) A material comprising a periodic porous polydendrimer with uniform pores of tunable size.
2. (currently amended) The material according to claim 1 wherein the periodic porous polydendrimer is a periodic mesoporous polydendrimer.
3. (currently amended) The material according to claim 1 wherein the periodic porous polydendrimer is a periodic macroporous polydendrimer.
4. (original) The material according to claim 2 wherein the periodic mesoporous polydendrimer is periodic mesoporous dendrisilica.
5. (original) The material according to claim 3 wherein the periodic macroporous polydendrimer is periodic macroporous dendrisilica.
6. (previously presented) The material according to claim 4 wherein the dendrisilica is made from dendrimer  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_4$  (1).
7. (previously presented) The material according to claim 4 wherein the dendrisilica is made from  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{Oi-Pr})_3]_4$  (i-Pr = isopropoxy) (2).
8. (previously presented) The material according to claim 4 wherein the dendrisilica is made from dendrimer  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}((\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3)_3]_4$  (3).

9. (currently amended) The material according to claim 4 wherein the dendrisilica is made from dendrimer  $[\{(EtO)_3Si(C_2H_4)\}_3]SiCH_2Si[(C_2H_4)Si(OEt)_3]_3$   
 $[\{(EtO)_3Si(C_2H_4)\}_3]SiCH_2Si[(C_2H_4)Si(OEt)_3]_3$  (4).
10. (currently amended) The material according to claim 1 wherein the polydendrimer is made of a single type of dendrimer comprising a polymerizable group at an the outmost shell of the dendrimer.
11. (currently amended) The material according to claim 1 wherein the polydendrimer is a mixture of two or more dendrimers, each dendrimer of the mixture comprising a polymerizable group at an the outmost shell of the dendrimer.
12. (previously presented) The material according to claim 10 wherein the polymerizable group is a tri-alkoxysilyl group or trichloro-silyl group.
13. (previously presented) The material according to claim 10 wherein the polymerizable group is a vinyl group.
14. (previously presented) The material according to claim 1 formed as a powder.
15. (previously presented) The material according to claim 1 formed as a film.
16. (previously presented) The material according to claim 1 formed as a monolith.
17. (previously presented) The material according to claim 1 formed as a fiber.
18. (original) A dendrimer tetrakis[2-(tris-(triethoxy, 2-ethylsilyl)silyl)ethyl]silane having a formula  $Si[(C_2H_4)Si((C_2H_4)Si(OEt)_3)_3]_4$  (3).

19. (currently amended) A dendrimer bis-[tris-(2-(triethoxysilyl)ethyl)disila]methane having a formula  $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$   $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$  (4).
20. (currently amended) A method of synthesizing a periodic porous polydendrimer with uniform pores of tunable size, comprising:  
 mixing a dendrimer with a template under conditions suitable for self-assembly of the dendrimer to form a polydendrimer encapsulating the template; and  
 removing the template from the polydendrimer to give a the periodic porous polydendrimer with uniform pores of tunable size.
21. (original) The method according to claim 20 wherein the template is chosen to give a periodic mesoporous polydendrimer.
22. (original) The method according to claim 21 wherein the dendrimer is chosen to give a polydendrimer which is a periodic mesoporous dendrisilica.
23. (original) The method according to claim 20 wherein the template is chosen to give a periodic macroporous polydendrimer.
24. (original) The method according to claim 23 wherein the dendrimer is chosen to give a polydendrimer which is a periodic macroporous dendrisilica.
25. (previously presented) The method according to claim 22 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_4$  (1).
26. (previously presented) The method according to claim 22 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{Oi-Pr})_3]_4$  (i-Pr = isopropoxy) (2).
27. (previously presented) The method according to claim 22 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}((\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3)]_4$  (3).

28. (currently amended) The method according to claim 22 wherein the dendrimer is  $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$   $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$  (4).

29. (previously presented) The method according to claim 20 wherein the template is a non-ionic surfactant.

30. (previously presented) The method according to claim 20 wherein the template is an ionic surfactant.

31. (previously presented) The method according to claim 20 wherein the template is a colloidal crystal template.

32. (cancelled)

33. (currently amended) The method according to claim 20 wherein the polydendrimer is made by polymerization of a dendrimer comprising a polymerizable group at an the outmost shell of the dendrimer, and wherein the polydendrimer self-assembles prior to polymerization of the polymerizable group.

34. (currently amended) The method according to claim 20 wherein the polydendrimer is made by polymerization of a mixture of two or more types of dendrimers, each dendrimer of the mixture of two or more dendrimers comprising a polymerizable group at an the outmost shell of each dendrimer.

35. (currently amended) The ~~material~~ method according to claim 33 wherein the polymerizable group is a tri-alkoxysilyl group or trichloro-silyl group.

36. (currently amended) The ~~material~~ method according to claim 33 wherein the polymerizable group is a vinyl group.

37. (previously presented) The method according to claim 20 formed as a powder.

38. (currently amended) The method according to claim 20 wherein the periodic porous polydendrimer is formed as a film.

39. (currently amended) The method according to claim 20 wherein the periodic porous polydendrimer is formed as a monolith.

40. (currently amended) The method according to claim 20 wherein the periodic porous polydendrimer is formed as a fiber.

41. (previously presented) The method according to claim 20 wherein the step of removing the template includes heating to sufficient temperature to decompose the template, or solvent extraction, supercritical fluid extraction photolytic decomposition, or plasma etching of the template.

42. (previously presented) The method according to claim 20 including a post-synthesis step of attaching a reactive chemical group to the dendrimers of the polydendrimer.

43. (original) The method according to claim 38 wherein the film is made by spin-coating, dip-coating or casting a solution containing the dendrimer and template on a substrate, after which the film on the substrate is dried and thereafter the template is removed.

44. (original) The method according to claim 39 wherein the monolith is made using a sol-gel method, wherein the dendrimers are mixed with the template in an aqueous solution to give a homogeneous sol, inducing gelation of the sol in a reaction vessel of pre-selected shape to give a monolith of pre-selected shape, after which the template is extracted with organic or inorganic solvents.

45. (original) The method according to claim 40 wherein the fiber is made by extruding or spinning a viscous sol containing the dendrimers, the template and the solvent to produce a polydendrimer/template nanocomposite fiber, after which the template is removed from the fibers by solvent extraction to leave a porous polydendrimer.

46. (currently amended) A method of producing a periodic macroporous polydendrimer, comprising the steps of:  
infiltrating a dendrimer into void spaces of a colloidal crystal template comprising colloidal particles;  
polymerizing the dendrimer to form a polydendrimer; and  
removing the colloidal crystal template to give a the periodic macroporous polydendrimer with uniform pores of tunable size.

47. (currently amended) The method according to claim 46 wherein the polydendrimer is made by polymerization of a dendrimer comprising a polymerizable group at an the outmost shell of the dendrimer, and wherein the polydendrimer self-assembles prior to polymerization of the polymerizable group.

48. (original) The method according to claim 46 wherein the polydendrimer is made by polymerization of a mixture of two or more types of dendrimers, each dendrimer of the mixture of two or more dendrimers comprising a polymerizable group at an outmost shell of each dendrimer.

49. (cancelled)

50. (previously presented) The method according to claim 47 wherein the polymerizable group is a tri-alkoxysilyl group or trichloro-silyl group.

51. (previously presented) The method according to claim 47 wherein the

polymerizable group is a vinyl group.

52. (original) The method according to claim 46 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_4$  (1).

53. (original) The method according to claim 46 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{Oi-Pr})_3]_4$  (2) (i-Pr = isopropoxy).

54. (original) The method according to claim 46 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}((\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3)]_4$  (3).

55. (currently amended) The method according to claim 46 wherein the dendrimer is  $\{[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\}\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt}_3)]_3$   $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$  (4).

56. (previously presented) The method according to claim 46 wherein the step of removing the colloidal crystal template to give a macroporous polydendrimer includes heating to sufficient temperature to decompose the colloidal crystal template.

57. (previously presented) The method according to claim 46 wherein the step of removing the colloidal crystal template to give a macroporous polydendrimer includes solvent extraction, supercritical fluid extraction, photolytic decomposition, or plasma etching of the colloidal crystal template.

58. (currently amended) A periodic macroporous polydendrimer produced by the steps comprising:

infiltrating a dendrimer into void spaces in a colloidal crystal template comprised of colloidal particles;

polymerizing the dendrimer to produce a polydendrimer; and

removing the colloidal particles to give a the periodic macroporous polydendrimer with uniform pores of tunable size.

59. (cancelled)

60. (previously presented) The method according to claim 20 wherein the template is a combination of molecular, polymer or colloidal templates, to produce a porous polydendrimer having at least two different sizes of pores.

61. (original) A method of synthesizing a periodic mesoporous macroporous polydendrimer comprising infiltrating a dendrimer and a mesoscale template into a macroscale colloidal template material under conditions suitable for polymerization of the dendrimer followed by removing both the mesoscale and macroscale template materials from the polydendrimer/template composite to give a periodic mesoporous macroporous polydendrimer (PMeMaP).

62. (new) The material according to claim 5 wherein the dendrisilica is made from dendrimer  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_4$  (1).

63. (new) The material according to claim 5 wherein the dendrisilica is made from dendrimer  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{Oi-Pr})_3]_4$  (i-Pr = isopropoxy) (2).

64. (new) The material according to claim 5 wherein the dendrisilica is made from dendrimer  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}((\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3)]_4$  (3).

65. (new) The material according to claim 5 wherein the dendrisilica is made from dendrimer  $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$  (4).

66. (new) The method according to claim 24 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_4$  (1).

67. (new) The method according to claim 24 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{Oi-Pr})_3]_4$  (i-Pr = isopropoxy) (2).

68. (new) The method according to claim 24 wherein the dendrimer is  $\text{Si}[(\text{C}_2\text{H}_4)\text{Si}((\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3)_3]_4$  (3).

69. (new) The method according to claim 24 wherein the dendrimer is  $[(\text{EtO})_3\text{Si}(\text{C}_2\text{H}_4)]_3\text{SiCH}_2\text{Si}[(\text{C}_2\text{H}_4)\text{Si}(\text{OEt})_3]_3$  (4).

70. (new) The material according to claim 11 wherein the polymerizable group is a tri-alkoxysilyl group or trichloro-silyl group.

71. (new) The material according to claim 11 wherein the polymerizable group is a vinyl group.

72. (new) The method according to claim 34 wherein the polymerizable group is a tri-alkoxysilyl group or trichloro-silyl group.

73. (new) The method according to claim 34 wherein the polymerizable group is a vinyl group.

74. (new) The method according to claim 48 wherein the polymerizable group is a tri-alkoxysilyl group or trichloro-silyl group.

75. (new) The method according to claim 48 wherein the polymerizable group is a vinyl group.